

## CLAIMS

- 1           Device (10) for the automatic reading of a plurality of codes by means of a key code comprising:
- a plurality of inserts (34) having at least one visible face suitable for carrying distinctive elements, said inserts being combined in a movable manner, so that the distinctive elements applied to at least one visible face of every insert form a plurality of strings (A-H),
- means (38, 40, 42, 44) for positioning said strings alongside each other in parallel mode so as to align the distinctive elements of several strings according to a direction that is basically transversal with respect to the direction of the strings, the first distinctive elements of each string forming the key code, the second distinctive elements of each string forming a code to be remembered, and so on wherein the N<sup>th</sup> distinctive element of each string forms the N<sup>th</sup> code to be remembered, and
- means for varying the relative position between at least two strings from the initial configuration, wherein when the key code is formed it is possible to read the other codes on the strings in transversal direction, to a position in which the distinctive elements of at least one string appear misaligned compared to the distinctive elements of the other strings.
- 25           2.       Device (10) for the automatic reading of a

plurality of codes by means of a key code as described in claim 1, comprising:

a plurality of drums (12) designed to rotate around an axis (14) and

5        said plurality of inserts (34) having visible faces carrying distinctive elements, said inserts being connected in a movable manner along the side edge of each of said drums to form said strings,

wherein said drums (12) can be adjacently positioned  
10      in an axial (14) direction in order to align the distinctive elements of the plurality of drums.

3.        Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 2 wherein said drums (12) comprise at least one axial pin (20) designed for insertion in a seat formed in  
15      one of said inserts (34).

4.        Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 2, wherein said drums (12) include at least one radial pin adapted to be inserted in a seat formed in one  
20      of said inserts (34).

5.        Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 3 or 4, wherein said at least one axial or radial  
25      pin includes a snap-on locking means to prevent said

inserts (34) from slipping out of position.

6. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 2 to 5, wherein at least one of said inserts (34) is a quadrangular based prism, each of the side faces carrying a distinctive element.

7. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 2 to 5, wherein at least one of said inserts (34) is a cylindrical element whose side wall carries at least one distinctive element.

8. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 2 to 5, wherein at least one of said inserts (34) is a triangular based prism, each one of the side faces carrying a distinctive element.

9. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claims 6 and 8 wherein said drums (12) comprise quadrangular prism inserts (34) alternating with triangular based prism inserts (34).

10. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 2 to 9, wherein said drums comprise at least one slot (180) adapted to receive an insert (34).

11. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 10, wherein at least one of said slots (180) extends inside the drum in a direction that is substantially parallel to the said axis (14).

12. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 10 or 11, wherein said inserts (34) are manufactured as a sheet or plate material suitable for insertion in the respective slots (180).

13. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 2 to 12, wherein at least one of said drums (12) includes at least one lobe (160).

14. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 13, wherein at least one of said drums (12) includes a plurality of lobes (160).

15. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 13 or 14 wherein each lobe (160) has at least one slot (180), adapted to receive an insert (34).

16. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 13 or 14, wherein each lobe (160) has two

slots, each one suitable for receiving an insert (34).

17. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 2 to 16, wherein a rod (38) is provided  
5 that is suitable for receiving said drums (12) positioned adjacently in an axial direction, said drums possessing a through seat to receive said rod (38).

18. Device (10) for the automatic reading of a plurality of codes by means of a key code according to  
10 claim 17, wherein said rod (38) comprises a first stop (40) fixedly attached to one end of the rod itself.

19. Device (10) for the automatic reading of a plurality of codes by means of a key code according to  
claim 18, wherein said first stop (40) has a radial  
15 extension equal to the radial extension of the drums (12).

20. Device (10) for the automatic reading of a plurality of codes by means of a key code according to  
claim 18 or 19, wherein said rod (38) comprises a second  
20 stop (42) that can be inserted onto the opposite end of  
the rod from said first stop (40) and is adapted to be  
fixed to the rod itself.

21. Device (10) for the automatic reading of a plurality of codes by means of a key code according to  
25 claim 20, wherein a locking member (44) is provided to

prevent said drums (12) and said second stop (42) from slipping from their position.

22. Device (10) for the automatic reading of a plurality of codes by means of a key code according to 5 claim 20, wherein said second stop (42) comprises flexible fins (420) designed to be attached to one end (380) of the rod (38).

23. Device (10) for the automatic reading of a plurality of codes by means of a key code according to 10 one of claims 2 to 22, wherein stepwise rotation means (22) are provided to rotate each drum (12) by a pre-determined angle.

24. Device (10) for the automatic reading of a plurality of codes by means of a key code according to 15 claim 23, wherein said drums (12) comprise a hollow cylindrical seat (26) co-axial with said longitudinal axis (14) and a side wall (24) with at least one axial groove adapted to interact with axial ribs or blades (32) formed on a portion of the adjacent drum.

20 25. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 23, wherein said drums include a hollow cylindrical seat (26) that is coaxial with said longitudinal axis (14), and including a side wall (24) with at least one 25 knurled axial portion (28) adapted to interact with axial

ribs or blades (32) on a portion of the adjacent drum.

26. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 23, wherein said drums (12) include a hollow cylindrical seat (26) that is co-axial with said longitudinal axis (14) and including a side wall (30) with at least one axial groove adapted to interact with axial ribs on a rod (38).

27. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 23, wherein said stepwise rotation means comprise a specially shaped shaft (460) on which said drums are mounted, said shaped shaft (460) comprising at least one tooth (600) suitable for insertion between two grooves (240) in a through seat (26) formed in at least one of the said drums (12).

28. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 27, wherein said specially shaped shaft (460) is manufactured from a resiliently conformable material that is flexibly movable during the rotation of drums (12) around said axis (14).

29. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 27 or 28, wherein said specially shaped shaft (460)

includes a first portion (460a) consisting of a complete wall and a second portion (460b) provided with incisions (560) that form at least two axial sectors (580a, 580b).

30. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 27 or 28, wherein said specially shaped shaft (460) comprises a first portion (460a) consisting of a complete wall and a second portion (460b) with incisions (560) that form a series in sequence of axial sectors (580a, 10 580b).

31. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 29 or 30, wherein at least one of the said axial sectors (580a, 580b) comprises said at least one tooth (600).

32. Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 29 to 31, wherein at least a first axial sector (580a) has an essentially semi-cylindrical shape 20 as an extension of the first portion (460a).

33. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 32, wherein at least a second axial sector (580b) has an essentially semi-cylindrical shape with a radius 25 slightly smaller than at least one said first axial

sector (580a).

34. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 33, wherein said at least one second axial sector 5 (580b) includes said at least one tooth (600) that extends radially further beside the radial dimension of said at least one first axial sector (580a).

35. Device (10) for the automatic reading of a plurality of codes by means of a key code according to 10 one of claims 27 to 34, wherein said specially shaped shaft (460) is hollow and has a seat (480) that is co-axial with said axis (14).

36. Device (10) for the automatic reading of a plurality of codes by means of a key code according to 15 claim 35, wherein said specially shaped hollow shaft (460) is adapted to house a rod (38).

37. Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 36, wherein said specially shaped shaft (460) 20 includes a baffle plate (500) provided at a determined axial position within the seat (480) of the specially shaped shaft (460) and provided with a hole (520) with a radial extension adapted to house the rod (38).

38. Device (10) for the automatic reading of a 25 plurality of codes by means of a key code according to

claim 36 or 37, wherein said specially shaped shaft (460) includes two slots (540) that extend in the axial direction and are suitable for receiving fins (360) attached to the rod (38).

5        39.        Device (10) for the automatic reading of a plurality of codes by means of a key code according to one of claims 2 to 38, wherein washers (640) are provided for insertion between two adjacent drums (12).

10      40.        Device (10) for the automatic reading of a plurality of codes by means of a key code according to any one of the previous claims wherein at least one of said inserts (34) carries pre-printed distinctive elements.

15      41.        Device (10) for the automatic reading of a plurality of codes by means of a key code according to any one of claims 1 to 40, wherein at least one of said inserts (34) has at least one visible face suitable for writing or engraving said distinctive elements.

20      42.        Device (10) for the automatic reading of a plurality of codes by means of a key code according to any one of claims 2 to 41, wherein at least one of said inserts (34) includes a tessera that is fixed to the respective drum in a direction perpendicular to the rotation axis (14).

25      43.        Device (10) for the automatic reading of a

plurality of codes by means of a key code according to claim 42, wherein said at least one insert (34) is fixed to the respective drum through a snap-on locking system, to prevent the elements from sliding from their position.

5       **44.**       Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 1, wherein said inserts (34) are manufactured in the form of sections on a display adapted to be aligned or misaligned in relation to one another.

10       **45.**       Device (10) for the automatic reading of a plurality of codes by means of a key code according to any one of claims 2 to 44, wherein at least two units (10a) are provided, which are adjacent to one another and include a plurality of drums (12) having lobes or teeth (160), the lobes of one unit (10) meshing with the lobes 15 of the adjacent units.

20       **46.**       Device (10) for the automatic reading of a plurality of codes by means of a key code according to claim 45, wherein locking means are operatively associated to the ends of the units (10) to maintain them 25 in the radial direction position.